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IMPLEMENTATION PLAN REVIEW FOR NEW HAMPSHIRE AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

Environmental Protection Agency
Research Triangle Park, North Carolina

February 1975

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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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EPA-450/3-75-014

IMPLEMENTATION PLAN REVIEW

FOR

NEW HAMPSHIRE

AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

PREPARED BY THE FOLLOWING TASK FORCE:

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Research Triangle Park, North Carolina 27711

February 1975

NEW HAMPSHIRE

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are (1) The use of the example region approach in developing State-wide air quality control strategies; (2) the existence of State Air Quality Standards which are more stringent than NAAQS; and (3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there have been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based are the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution situations such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emission and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO_2 and TSP emission tolerance within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Section 2 and Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, and E.

The State Implementation Plan for the State of New Hampshire has been reviewed for the most prevalent causes of over-restrictive fuel combustion, emission limiting, regulations. The major findings of the review are:

FOR TOTAL SUSPENDED PARTICULATES, THERE IS ONLY ONE AQCR, CENTRAL NEW HAMPSHIRE, WHICH INDICATED A GOOD POTENTIAL FOR REVISING FUEL COMBUSTION SOURCE EMISSION LIMITING REGULATIONS.

FOR SO_2, THERE ARE TWO AQCR'S, ANDROSCOGGIN VALLEY AND MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE WHICH INDICATE A GOOD POTENTIAL FOR REVISING FUEL COMBUSTION SOURCE EMISSION LIMITING REGULATIONS.

The supportive findings of the SIP review are as follows:

New Hampshire currently uses very little coal for fuel combustion. Almost all fuel combustion sources in the State use fuel oil. In most cases the use of low sulfur coal and existing emission control technology would be more consistent with national energy policies.

Considerably more modeling data are needed throughout the State of New Hampshire; particularly in areas around the large sources of emissions. It is difficult to evaluate the impact of a regulation revision on air quality without knowing how air quality is affected by local sources.

Additional SO_2 monitoring is needed in AQCR 149, Central New Hampshire before a complete assessment of the SO_2 regulation revision potential can be made.

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on (1973) air quality data, are there no reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?
- Is there a significant clean fuels savings potential in the region?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices

provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, E.

Based on an overall evaluation of EPA's current information, AQCR's have been classified as good, marginal, or poor candidates for regulation revisions. Table 2-1 summarizes the State Implementation Plan Review. The remaining portion of the report supports this summary with explanations.

TABLE 2-1

STATE IMPLEMENTATION PLAN REVIEW
(SUMMARY)

"Indicators"	New Hampshire		Androscoggin Valley AQCR 107		Merrimack Valley-Southern New Hampshire AQCR 121		Central New Hampshire AQCR 149	
	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	No	Yes [a]						
• Does the State have emission limiting regulations for control of:								
1. Power plants	Yes	Yes						
2. Industrial sources	Yes	Yes						
3. Area sources	Yes	Yes						
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	Yes	Yes						
• Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	No						
• Are there no proposed Air Quality Maintenance Areas?			Yes	Yes	Yes	Yes	Yes	Yes
• Are there indications of a sufficient number of monitoring sites within a region?			Yes	Yes	Yes	Yes	Yes	No
• Is there an expected 1975 attainment data for NAAQS?			Yes	Yes	Yes	Yes	Yes	Yes
• Based on (1973) Air Quality Data, are there no reported violations of NAAQS?			No	Yes	No	Yes	Yes	Yes
• Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	Yes	No	Yes	Yes	No
• Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?			Yes	No	Yes	No	Yes	No [a]
• Do modeling results for fuel combustion sources show a potential for a regulation revision?			N.A.	N.A.	Yes [b]	Yes [b]	N.A.	N.A.
• Must emission limiting regulations be revised to accomodate significant fuel switching?			No	No	No	No	No	No
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			Poor	Good	Poor	Good	Good	Marg. [c]
• Is there a significant Clean Fuels Saving potential in the region?			No		No		No	

a - Due to the fact that Federal secondary SO_2 standards (annual and 24-hour) were eliminated.

b - Modeling results available for only one power plant.

c - Based on lack of SO_2 monitoring data.

2.2 AIR QUALITY SETTING -- STATE OF NEW HAMPSHIRE

The State of New Hampshire is divided into three AQCR's. These are AQCR 107, Androscoggin Valley Interstate (New Hampshire and Maine); AQCR 121, Merrimack Valley - Southern New Hampshire Interstate (New Hampshire and Massachusetts); and AQCR 149, Central New Hampshire Intrastate (Figure 2-1).

A summary of the Federal and New Hampshire air quality standards for total suspended particulates, SO_2, and NO_x is presented in Table A-3. The New Hampshire standards as originally published in the State Implementation Plan were identical to the Federal secondary standards. Since the Federal secondary standards for SO_2 annual and 24-hour average concentrations were eliminated, these New Hampshire standards are now more stringent than Federal.

Air quality monitoring appears to be fairly adequate throughout most of the State based on analysis of 1973 SAROAD (Storage and Retreival of Aerometric Data) System information. The one exception is AQCR 149, Central New Hampshire. There were no data reported from SO_2 monitors in this region during 1973.

A summary of the New Hampshire Air Quality Status is presented in Tables A-4 and A-5. It is significant to note that there were no violations of Federal SO_2 standards reported during 1973. There were, however, several violations of the Federal particulate standards, mostly secondary, reported.

A summary of significant New Hampshire emission sources is presented in Table A-6, as well as the total particulate and SO_2 emissions. The percentage of the total emissions contributed by New Hampshire fuel combustion sources is also shown. Tables A-7 and A-8 follow from Table A-6 by giving a more detailed analysis of existing emissions.[1]

In general, New Hampshire's air pollution tends to be concentrated in the northern (AQCR 107) and southern (AQCR 121) portion of the State. Almost all of the State's SO_2 emissions are accounted for by fuel combustion with

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[1] All emissions data taken from NEDS.

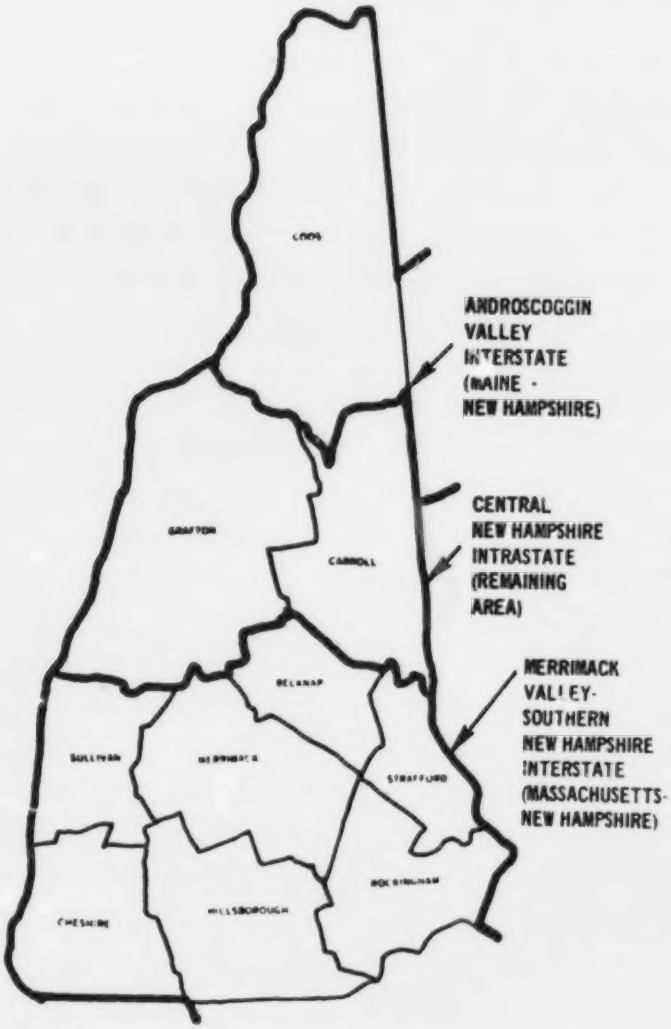


Figure 2-1 New Hampshire Air Quality Control Regions

about half of that due to power plant operation. One third of the particulate emissions can be attributed to fuel combustion and an almost equal amount to solid waste disposal.

2.3 BACKGROUND ON THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

The SIP control strategies and regulations were based on the example region approach. The example region used for the development of both particulate and SO_2 regulations was comprised of Merrimack, Hillsborough, and Rockingham Counties. These three counties are in AQCR 121 and incorporate the largest power plants in the State. Manchester and Nashua were of greatest concern in Hillsborough County, while Portsmouth was the area of concern in Rockingham County.

The regulation adopted for the control of particulate matter from fuel combustion sources is based on the input firing rate. It is applicable to all fuel burning equipment in the State, and is displayed graphically in Figure A-1. The State particulate emission regulation for new sources complies with the Federal Standard for New Stationary Sources exceeding 250 million BTU per hour.

A sulfur content limitation is used to control sulfur oxide emissions from fuel combustion sources in New Hampshire. The maximum allowable sulfur content is determined by type of fuel burned (coal, oil, or gas) and whether or not the source existed at the time of adoption of the regulation. On October 17, 1974, the State approved a variance which permitted the use of higher sulfur fuel oil in two of the three AQCR's. The current SO_2 regulation and the variance are explained in detail in Appendix A.

3.0 AQCR ASSESSMENTS BASED ON SIP REVIEWS

The purpose of this section is to evaluate the available information for the State of New Hampshire and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessments will be made by AQCR addressing each type of fuel combustion source: power plants, large industrial and commercial/institutional sources, and area sources. The criteria used to make the assessments are listed and tabulated in Section 2.1 and Table 2-1 of this report. Tables B-1 and B-2 present a quantitative display of some of the criteria in Table 2-1.

The AQCR's are grouped into good, marginal, and poor candidates for regulation relaxation based on the evaluation of all the presented information. Using available data, any AQCR which displays a 1973 air quality violation would probably be given a poor ranking. Conversely, a region with no violations, no proposed AQMA designations, low to moderate emissions, a positive emission tolerance, and/or a small fraction of emissions from New Hampshire fuel combustion sources would receive a good ranking. All other regions with varying indicators or incomplete or missing data would be evaluated separately and grouped in the appropriate class, most likely a marginal ranking.

The source type groups are evaluated separately using such variables for criteria as modeling results, emissions data from the SIP and/or NEDS, and air quality data.

3.1 ANDROSCOGGIN VALLEY INTERSTATE AQCR 107

3.1.1 Regional Air Quality Assessment

The Androscoggin Valley AQCR received a poor ranking as a candidate for particulate regulation revision based primarily on the fact that three monitoring stations reported violations of the particulate standards in 1973. There are some significant sources in Maine which may contribute to the air quality in New Hampshire. An evaluation of the impact of Maine's sources on New Hampshire's air quality could only be made after reviewing the results of a regional modeling effort. Since the other indicators indicate that this

region would be a good candidate for regulation revision, the ranking could be reversed if modeling results showed that New Hampshire sources were not a significant cause of the air quality violations of 1973.

The Androscoggin Valley AQCR was ranked as a good candidate for revision of SO_2 regulations. There are no proposed Air Quality Maintenance Areas, there were no SO_2 Air Quality Standard violations reported in 1973, and there is a large tolerance for SO_2 emissions increase based on 1973 air quality data. However, since fuel combustion sources contribute such a high percentage of the emissions from New Hampshire sources, the large tolerance for emissions increase could easily be used up by a small change in the regulation.

3.1.2 Power Plant Summary

There are three electric generation facilities in the Region. Only one of these is located in New Hampshire, and it is an oil fired gas turbine plant belonging to the Public Service Co. of New Hampshire; their Lost Nation Plant. Both particulate and SO_2 emissions from this plant are insignificant to the State's total.

3.1.3 Industrial and Commercial/Institutional Source Summary

There are three significant fuel combustion particulate sources which are also the only three significant SO_2 fuel combustion sources. They contribute an estimated one-seventh of the New Hampshire particulate emissions, and over three fourths of the SO_2 emissions. Existing regulations allow a very large increase in particulate emissions and no increase in SO_2 emissions since all significant SO_2 sources are presently burning oil with the maximum allowable sulfur content.

As pointed out in Section 3.1.1, it would be inadvisable to contemplate a revision in the particulate regulation without some modeling data. However, since the SO_2 standards were being met in 1973 with significant sources burning maximum allowable sulfur content fuel, this region has excellent potential for SO_2 regulation modification.

3.1.4 Area Source Summary

Available data indicate that area source fuel combustion sources are operating within the sulfur limitations imposed by State regulations. Since the particulate control regulations are based on boiler firing rate, it is impossible to evaluate the status of regulation compliance without additional area source data. A summary of the area source data is presented in Table E-1.

3.2 MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE INTERSTATE AQCR 121

3.2.1 Regional Air Quality Assessment

The Merrimack Valley - Southern New Hampshire AQCR was ranked as a poor candidate for particulate regulation revision because of four violations of the particulate standards in 1973. Again, as in the previous interstate region, detailed modeling results are necessary before an evaluation can be made of the impact of New Hampshire sources on the air quality. However, since the New Hampshire portion of this region includes most of the State's larger population centers and industrial areas, it seems unlikely that the regulations could be revised without having an adverse effect on air quality in the region.

The region was ranked as a good candidate for revision of SO_2 regulations based on 1973 air quality data. However, since such a high percentage of the region's SO_2 emissions originate with fuel combustion, air quality could be very sensitive to even small changes in control regulations. In October 1974, the New Hampshire Air Pollution Control Commission approved a variance which allows the burning of 2.0 percent sulfur residual oil. The effects of this variance are not present in the air quality data available for this study, and any regulation revision should be delayed until an evaluation of the effects can be made.

3.2.2 Power Plant Summary

There are five steam electric power generating stations in the New Hampshire portion of this region; all operated by the Public Service Co. of New Hampshire. They are the Merrimack Plant, the Schiller Plant, the Daniel St. Plant, the Newington Plant, and the Manchester Plant. One of these, the

Merrimack Plant, uses coal as its major source of energy. All plants currently operating in the region are burning fuel oil with the maximum allowable sulfur content by State regulations. Therefore, without switching to coal, these plants could not use a higher sulfur content fuel unless existing regulations were revised.

Power plants in the region could possibly increase their particulate emissions and still be within the legal limits, but since 1973 air quality data indicate high concentrations of total suspended particulate, this seems inadvisable at this time.

Air quality around the Schiller Plant was modeled by Walden, assuming a switch to coal containing 2.5 percent sulfur and 15 percent ash. The results are shown below. It is interesting to note that these results indicate a fuel switch to coal would be feasible. However, these results are for one plant only and, therefore, nothing can be said about the advisability of fuel switches at other plants.

Table 3-1 Schiller Plant Modeling Results ($\mu g/m^3$)[a]
[2.5% Sulfur, 15% Ash Coal]

	Maximum 24-hr Concentration		Maximum Annual Concentration	
	TSP	SO_2	TSP	SO_2
Nominal Load	27	156	2	12
Maximum Load	27	154		

[a]Modeling Analysis of Power Plants for Fuel Conversion (Group IV), Walden Research Division of Abcor Inc., Sept. 12, 1974

3.2.3 Industrial and Commercial/Institutional Source Summary

Significant fuel combustion sources of this category in Region 121 number six for particulates and seventeen for SO_2. They contribute approximately one tenth of the total particulate and SO_2 emissions from all New Hampshire sources.

Small increases in both particulate and SO_2 emissions can be made without regulation revision. However, in light of the 1973 air quality data, even an increase of particulate emissions to the maximum currently allowable would be unwise. More recent air quality data should be examined prior to making a decision on particulate regulation revision.

Since the tolerance for SO_2 emissions increase, based on 1973 air quality data, is relatively large, it seems safe to say that an increase to the maximum allowable emissions would not have a large adverse effect on air quality. Again, more recent air quality data should be available prior to revising the regulations.

3.2.4 Area Source Summary

As is shown in Table E-1, area sources, as a whole, are complying with existing regulations. However, using available data it is impossible to evaluate particulate source compliance since input firing rates are not included.

3.3 CENTRAL NEW HAMPSHIRE INTRASTATE AQCR 149

3.3.1 Regional Air Quality Assessment

The Central New Hampshire AQCR was the only one of the three New Hampshire AQCR's reporting no particulate air quality violations in 1973. Therefore, it was also the only AQCR to receive a ranking of good in evaluating the potential for particulate regulation revision. Particulate emissions from fuel combustion sources comprise only a moderate portion of the total particulate emissions and therefore, increases in particulate emissions from fuel combustion sources are less likely to have a significant impact on air quality.

No air quality data are available on SO_2 concentrations in the region. Therefore, the region's SO_2 regulation revision potential was ranked as marginal. All indicators point toward a good ranking, but without air quality data no quantitative assessment can be made.

3.3.2 Power Plant Summary

The Public Service Co. of New Hampshire operates the only electric generation facility in the region. This is the White Lake Plant and it is a gas turbine plant burning distillate oil. Particulate and SO_2 emissions from this type of operation are very small, and form an insignificant part of the regional total.

3.3.3 Industrial and Commercial/Institutional Source Summary

There are four significant industrial and commercial/institutional sources of fuel combustion particulate emissions in this region. They contribute about one tenth of the regional particulate emissions. Particulate emissions from these sources would approximately double if all four plants increased their emissions to the maximum allowed by State regulations.

There are also four significant sources of SO_2 emissions in this source category. Together they emit about one third of the region's SO_2 emissions. Since all sources are burning fuel with either the maximum allowable sulfur content, or very close to it, it would require a regulation revision before they could burn fuel with a higher sulfur content. However, as stated before, SO_2 air quality data are inadequate to assess the impact of such a regulation revision.

3.3.4 Area Source Summary

Area sources in this region emit an estimated one fourth of the region's particulate fuel combustion emissions, and over half of the SO_2. As in the other two regions, available area source data are insufficient to evaluate the status of particulate control regulation compliance.

APPENDIX A

STATE IMPLEMENTATION PLAN BACKGROUND

TABLE A-1 NEW HAMPSHIRE AQCR PRIORITY CLASSIFICATIONS AND AQMA's

AQCR Name	AQCR No.	AQCR Priority Classification[a]			Demographic Information			AQMA Designations	
		TSP	SO_x	NO_x	Population 1975[b]	Area (sq. mi.)	Population Density (persons/mi.^{2})	TSP Counties	SO_x Counties
Androscoggin Valley[c]	107	I	I	III	36,346[d]	1,820[d]	20[d]	No	No
Merrimack Valley - Southern New Hampshire	121	I	I	III	679,026[d]	4,538[d]	150[d]	No	No
Central New Hampshire	149	III	III	III	77,545	2,670	29	No	No

a - Classification based on maximum measured (or estimated) pollution concentration in the area:

Priority	I	II	III
	Greater than	From - To	less than
Sulfur oxide:			
Annual arithmetic mean	100	60-100	60
24-hour maximum	455	260-455	260
Particulate matter:			
Annual geometric mean	95	60-95	60
24-hour maximum	325	150-325	150

b - Source: Projections of Economic Activity for Air Quality Control Regions, Prepared by U.S. Department of Commerce, Bureau of Economic Analysis, August 1973.

c - Interstate region.

d - Data are for the New Hampshire portion of the AQCR only.

TABLE A-2 ATTAINMENT DATES

AQCR Name	AQCR No.	TSP Attainment Dates		SO_2 Attainment Dates	
		Primary	Secondary	Primary	Secondary
Androscoggin Valley[a]	107	7/75	7/75	7/75	7/75
Merrimack Valley - Southern New Hampshire[a]	121	b	b	b	b
Central New Hampshire	149	7/75	7/75	7/75	7/75

a - Interstate region

b - Air quality levels presently below standards

TABLE A-3 AMBIENT AIR QUALITY STANDARDS ($\mu g/m^3$)

	TSP		SO_2			NO_x[2]
	Annual	24 hr	Annual	24 hr	3 hr	Annual
Federal						
Primary	75[a]	260[b]	80[c]	365[b]		100[c]
Secondary	60[a]	150[b]			1300[b]	100[c]
New Hampshire	60[a]	150[b]	60[c]	260[b]	1300[b]	100[c]

a - Annual geometric mean.

b - Maximum concentration not to be exceeded more than once a year.

c - Annual arithmetic mean.

TABLE A-4 NEW HAMPSHIRE AQCR AIR QUALITY STATUS(1973), TSP[a]

AQCR Name	AQCR No.	No. Stations Reporting	TSP Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-hr	2nd Highest Reading 24-hr	No. Stations Violating Federal Ambient Air Quality Standards: Primary Annual	Primary 24-hr[c]	Secondary Annual	Secondary %	Secondary 24-hr[c]	Secondary %	% Reduction Required to Meet Standards[d]	Standard on Which Reduction Is Based
Androscoggin Valley[b,e]	107	13	83	291	231	1	0	1	8	3	23	+39	Annual
Merrimack Valley - Southern[b,e] New Hampshire	121	30	60	209	197	0	0	0	0	4	13	+28	24-hr
Central New Hampshire	149	3	NA	162	110	NA	0	NA	-	0	0	-50	24-hr

a - 1973 air quality data in National Air Data Bank as of July 28, 1974.

b - Interstate region.

c - Violations based on second highest reading at any station.

d - Formula:

$$\frac{\text{(2nd Highest 24-hr - 24-hr Secondary Standard)}}{\text{(2nd Highest 24-hr - Background)}} \times 100$$

or:

$$\frac{\text{(Highest Annual - Annual Secondary Standard)}}{\text{(Highest Annual - Background)}}$$

whichever is more stringent

e - All noted values occurred in New Hampshire.

NA - Not available

TABLE A-5 NEW HAMPSHIRE AQCR AIR QUALITY STATUS(1973), SO_2[a]

AQCR Name	AQCR No.	No. Stations Reporting (24-hr Bubbler)	No. Stations Reporting (Contin.)	SO_2 Concentration($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-hr[c]	2nd Highest Reading 24-hr	No. Stations Violating Federal Ambient Air Quality Standards: Primary Annual	Primary 24-hr[c]	Secondary 3-hr	% Reduction Required To Meet Standards[d]	Standard On Which Reduction Is Based
Androscoggin Valley[b]	107	8	3	NA	173	66	NA	0	0	-453	24-hr
Merrimack Valley - Southern New Hampshire[b]	121	13	2	51	248	141	0	0	0	- 57	Annual
Central New Hampshire	149	0	0	--	--	--	0	0	0	--	----

a - 1973 air quality data in National Air Data Bank as of July 28, 1974

b - Interstate region.

c - Violations based on second highest reading at any station.

d - Formula:

$$\frac{\text{(2nd Highest 24-hr - 24-hr Standard)}}{\text{2nd Highest 24-hr}} \times 100$$

or:

$$\frac{\text{(Highest Annual - Annual Standard)}}{\text{Highest Annual}}$$

whichever is more stringent

TABLE A-6 NEW HAMPSHIRE FUEL COMBUSTION SOURCE SUMMARY

AQCR Name	AQCR No.	Power Plants[a]	Other Fuel Combustion Point Sources[b]		Area Sources[c]	Total Emissions (10^3 tons/yr)[d]		% AQCR Emissions From N.H. Fuel Combustion Sources	
			Part.	SO_x		Part.	SO_x	Part.	SO_x
Androscoggin Valley[e]	107	1	3	3	1	30.0	68.6	2	17
Merrimack Valley - Southern New Hampshire[e]	121	5	6[f]	17	7	19.9	114.0	22	33
Central New Hampshire	149	1	4	4	2	1.4	3.3	39	95

a - New Hampshire power plants only

b - New Hampshire point sources, not including power plants, which combined with power plants, contribute at least 90% of the point source fuel combustion emissions

c - Counties in New Hampshire only

d - AQCR total

e - Interstate region

f - These six sources combined with power plants contribute only 60% of the point source fuel combustion particulate emissions, but all other sources emit less than 30 tons of particulates per year.

TABLE A-7 NEW HAMPSHIRE EMISSIONS SUMMARY, PARTICULATES

AQCR Name	AQCR No.	Total Tons/yr	Percent Fuel Combustion[b]	Electricity Generation Point Sources[a]		Other Point Source Fuel Combustion		Area Source Fuel Combustion	
				Tons/yr	%[b]	Tons/yr	%[b]	Tons/yr	%[b]
Androscoggin Valley	107	29,979	20	476	2	3,705	12	1,853	6
N.H. Portion		2,515	21	17	1	356	14	145	6
Maine Portion		27,464	20	459	2	3,349	12	1,708	6
Merrimack Valley - Southern New Hampshire	121	19,921	42	774	4	2,339	12	5,293	27
N.H. Portion		12,581	34	774	6	980	8	2,558	20
Mass. Portion		7,340	56	0	0	1,359	19	2,735	37
Central New Hampshire	149	1,350	39	16	1	174	13	336	25

a - Power plants only. NEDS inventory includes some industrial power generation in this category.

b - Percentage of total emissions.

TABLE A-8 NEW HAMPSHIRE EMISSIONS SUMMARY, SO_2

AQCR Name	AQCR No.	Total Tons/yr	Percent Fuel Combustion[b]	Electricity Generation Point Sources[a]		Other Point Source Fuel Combustion		Area Source Fuel Combustion	
				Tons/yr	%[b]	Tons/yr	%[b]	Tons/yr	%[b]
Androscoggin Valley	107	68,618	85	10,980	16	37,223	54	10,430	15
N.H. Portion		12,205	94	14	0	10,563	87	913	7
Maine Portion		56,413	84	10,966	19	26,660	47	9,517	17
Merrimack Valley - Southern New Hampshire	121	113,999	98	52,046	46	19,183	17	40,276	35
N.H. Portion		79,948	98	52,046	65	10,085	13	16,294	20
Mass. Portion		34,051	97	0	0	9,098	27	23,982	70
Central New Hampshire	149	3,304	95	13	0	1,181	36	1,938	59

a - Power plants only. NEDS inventory includes some industrial power generation in this category.

b - Percentage of total emissions.

NEW HAMPSHIRE EMISSION REGULATIONS FOR STATIONARY FUEL COMBUSTION SOURCES

Particulates

All stationary combustion sources are limited to the maximum allowable particulate emissions obtained from the graph in Figure A-1.

Sulfur Oxides

- Coal: Existing installations may burn coal with a maximum sulfur content of 2.8 pounds per million BTU gross heat content, provided that the weighted average of all coal received during a tri-monthly period does not exceed 2.0 pounds per million BTU gross heat content. The limit for new installations is a maximum of 1.5 pounds of sulfur per million BTU gross heat content, with a maximum tri-monthly average of 1.0 pounds per million BTU.

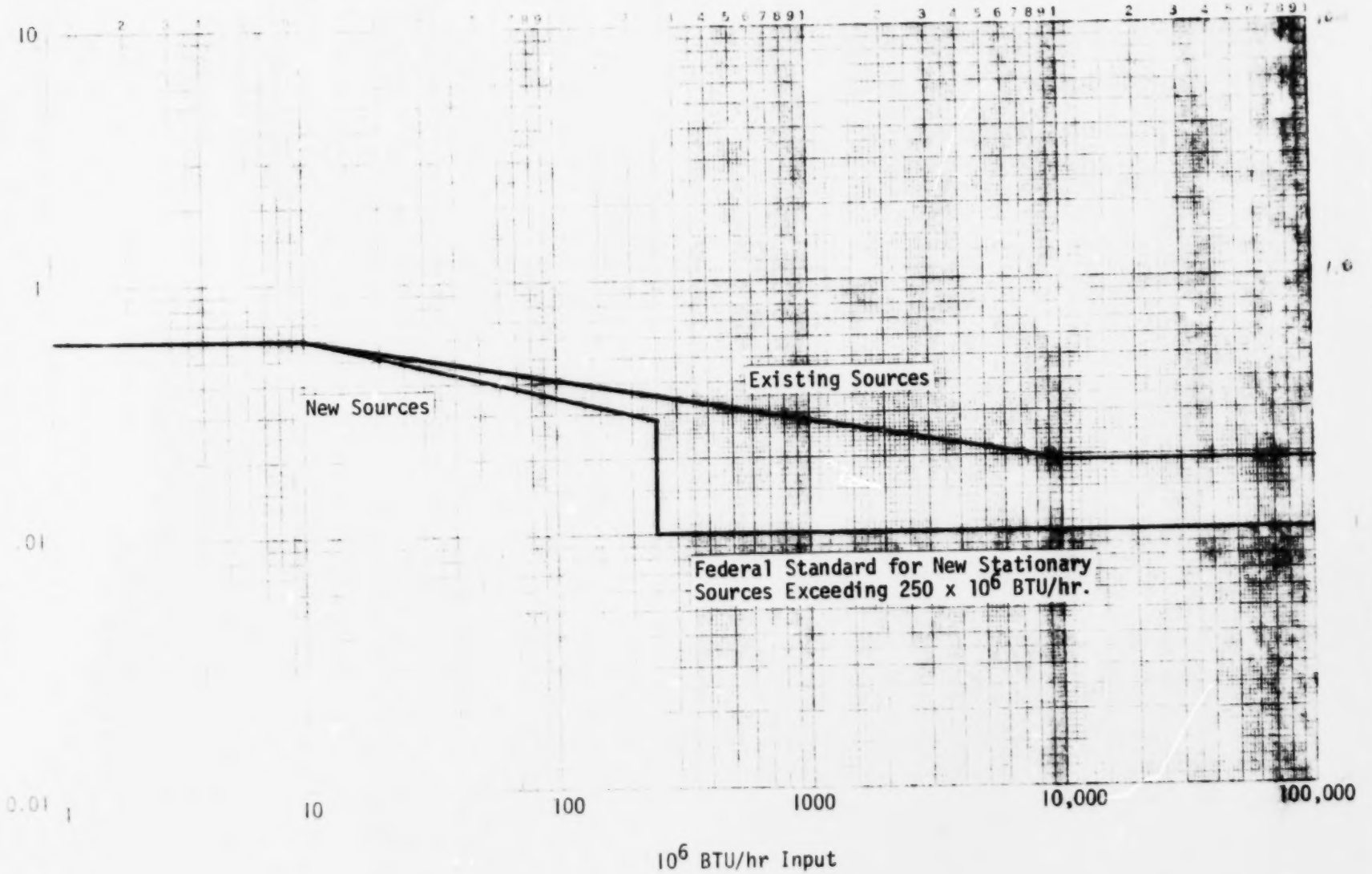
- Fuel Oils: Sources may burn No. 2 fuel oil with a maximum sulfur content of 0.4 percent by weight, No. 4 fuel oil with a maximum of 1.0 percent and No. 5 or No. 6 fuel oil with a maximum of 1.5 percent, except for use in the New Hampshire portion of the Androscoggin Valley Air Quality Control Region where a 2.2 percent sulfur limit for No. 5 and No. 6 fuel oil is permitted.

- Gaseous Fuels: A sulfur content of not more than 5 grains per 100 cubic feet calculated as hydrogen sulfide (H_2S) at standard conditions is permitted.

- Variance: On October 17, 1974, the New Hampshire Air Pollution Control Commission approved a variance which would permit the use of residual fuel oil (No. 5 and No. 6) whose sulfur content does not exceed 2.0 percent by weight until May 31, 1975 in the New Hampshire portion of the Merrimack Valley - Southern New Hampshire Interstate AQCR and in the Central New Hampshire Intrastate AQCR. This variance has been forwarded to EPA for approval/disapproval.

Figure A-1

NEW HAMPSHIRE ALLOWABLE PARTICULATE EMISSIONS FROM FUEL COMBUSTION SOURCES



APPENDIX B

REGIONAL AIR QUALITY SUMMARY

TABLE B-1

REGIONAL INDICATORS FOR REVISION OF PARTICULATE REGULATIONS

AQCR Name	AQCR No.	No. of Stations		Expected Attainment Date	Total Emissions (10^3 T/yr)	% Emission From N.H. Fuel Combustion	Tolerance For Emission Increase (10^3 t/yr)[c]
		Reporting	Violating[a] Standards				
Androscoggin Valley[d]	107	13	3	7/75	2.5	20.6	-11.7
Merrimack Valley - Southern New Hampshire[d]	121	30	4	e	12.6	34.3	- 5.6
Central New Hampshire	149	3	0	7/75	1.4	39.0	+ 0.7

a - 1973 data

b - For interstate regions this value is the contribution from sources in the New Hampshire portion only.

c - Based on percent reduction required to meet standards from Table A-4 applied against total emissions.

d - Interstate region

e - Air quality levels presently below standards.

TABLE B-2

REGIONAL INDICATORS FOR REVISION OF SO_2 REGULATIONS

AQCR Name	AQCR No.	No. of Stations Reporting	No. of Stations Violating[a] Standards	Expected Attainment Date	Total Emissions (10^3 T/yr)	% Emission From N.H. Fuel Combustion	Tolerance For Emission Increase (10^3 t/yr)[c]
Androscoggin Valley[d]	107	11	0	7/75	12.2	94.1	55.3
Merrimack Valley - Southern[d] New Hampshire	121	15	0	e	79.9	98.1	45.5
Central New Hampshire	149	0	-	7/75	3.3	94.8	NA[f]

a - 1973 data

b - For interstate regions this value is the contribution from sources in the New Hampshire portion only.

c - Based on percent reduction required to meet standards from Table A-4 applied against total emissions.

d - Interstate region

e - Air quality levels presently below standards.

f - Not available due to lack of SO_2 air quality monitoring equipment in Region 149.

APPENDIX C

POWER PLANT SUMMARY

TABLE C-1

EXISTING NEW HAMPSHIRE POWER PLANTS

AQCR Name	AQCR No.	Plant Name	1975 Capacity MW[a]	Fuel Type	Est. 1975 Quantity[b]	% S by Regulation[c]	Boiler Also Designed For Coal
Androscoggin Valley	107	Public Service Co. of New Hamp. Lost Nation Plant[d]	NA	oil	2,050	0.4	---
Merrimack Valley - Southern New Hampshire	121	Public Service Co. of New Hamp. Merrimack Plant	459	coal oil	914 2,134	2.6[e] 2.0	yes
		Public Service Co. of New Hamp. Schiller Plant	179	oil	86,210	2.0	yes
		Public Service Co. of New Hamp. Daniel St. Plant	21	oil	8,718	2.0	no
		Public Service Co. of New Hamp. Newington Plant[g]	424	oil	240,187[f]	2.0	no
		Public Service Co. of New Hamp. Manchester Plant	20	oil	8,344	2.0	no
Central New Hampshire	149	Public Service Co. of New Hamp. White Lake Plant[d]	NA	oil	1,860	0.4	---

a - Source: Steam Electric Plant Factors, 1973 Edition, National Coal Assn., Washington, D.C.
b - Coal in 10^3 Tons, Oil in 10^3 gal. NEDS data.
c - Regulation approved by State, but still awaiting EPA approval.
d - Gas turbine plant
e - Calculated from 2.0 pounds of sulfur per million BTU assuming 26 million BTU per ton of coal.
f - Calculated using 9.7 BTU/hr per megawatt of generating capacity and 150,000 BTU per gallon of fuel oil. Assume an overall plant efficiency of 35%
g - Plant scheduled to begin operation in 1974.

TABLE C-2

NEW HAMPSHIRE POWER PLANT SUMMARY BY AQCR

AQCR Name	AQCR No.	Fuel Type	1975 Fuel Required by Regulations[a] <2% S	1975 Fuel Required by Regulations[a] >2% S	1975 Emission Reduction (T/yr) Part.	1975 Emission Reduction (T/yr) SO_2
Androscoggin Valley	107	coal	0	0	--[b]	-14
		oil	2,050	0		
		gas	0	0		
Merrimack Valley - Southern New Hampshire	121	coal	0	914	-5152[c]	0
		oil	345,593	0		
		gas	0	0		
Central New Hampshire	149	coal	0	0	--[b]	NA[d]
		oil	1,860	0		
		gas	0	0		

a - Coal in 10^3 tons per year; oil in 10^3 gal. per year

b - Gas turbines not covered by State fuel combustion particulate regulations.

c - Includes no data from the new plant scheduled to begin operation in 1974.

d - Not available due to a lack of data in NEDS on present sulfur content.

APPENDIX D

INDUSTRIAL, COMMERCIAL/INSTITUTIONAL SOURCE SUMMARY

TABLE D-1

NEW HAMPSHIRE SIGNIFICANT SOURCES[a]

AQCR Name	AQCR No.	NEDS Emissions (T/yr)		Reduction Under Existing Regulations (T/yr)		% NEDS Particulate Emissions From Coal[b] (before regulations)
		Part.	SO_2	Part.	SO_2	
Androscoggin Valley	107	347	10,450	-1,564	0	0
Merrimack Valley - Southern New Hampshire	121	276	4,585	- 251	-85	0
Central New Hampshire	149	159	1,088	- 112	-21	0

a - See Table A-6

b - Only for significant sources not including power plants.

TABLE D-2

NEW HAMPSHIRE SIGNIFICANT INDUSTRIAL AND COMMERCIAL/INSTITUTIONAL SOURCES

AQCR Name	AQCR No.	Particulate Sources[a]		SO_2 Sources[a]	
		Plant Name	County	Plant Name	County
Androscoggin Valley	107	Groveton Papers Co.	Coos	Brown Co.	Coos
		Brown Co.	Coos	Brown Co. (Gorham Plant)	Coos
		Brown Co. (Gorham Plant)	Coos	Groveton Papers Co.	Coos
Merrimack Valley-Southern New Hampshire	121	Spaulding and Frost	Rockingham	Anheuser-Busch	Hillsborough
		Anheuser-Busch	Hillsborough	Univ. of N.H.	Strafford
		Emerson Mfg. Co.	Merrimack	Nashua Corp. (Nashua)	Hillsborough
		Univ. of N.H.	Strafford	Pease AFB	Rockingham
		Nashua Corp. (Nashua)	Hillsborough	Phillips Exeter Academy	Rockingham
		Sprague and Carleton	Cheshire	USM Corp. (Bosboard Div.)	Merrimack
				Spaulding Fiber Co.	Strafford
				Clemson Auto Fabrics	Rockingham
				Concord Steam Corp.	Merrimack
				Nashua - N.H. Foundation	Hillsborough
				Great Falls Bleachery	Strafford
				Ashuelot Paper Co.	Cheshire
				Nashua Corp. (Merrimack)	Hillsborough
				Hinsdale Products	Cheshire
				Syntextils	Hillsborough
				Paper Service Mills	Cheshire
				Homestead Woolen	Cheshire
Central New Hampshire	149	Draper Div. (N. Amer. Rockwell)	Grafton	Dartmouth College (McKenzie Hall)	Grafton
		L.W. Packard Co.	Grafton	L.W. Packard Co.	Grafton
		Hitchcock Mem. Hosp.	Grafton	Hitchcock Mem. Hosp.	Grafton
		Dartmouth College (McKenzie Hall)	Grafton	Plymouth State College	Grafton

a - Sources listed in descending order of emission quantities.

APPENDIX E

AREA SOURCE SUMMARY

TABLE E-1

NEW HAMPSHIRE AREA SOURCES[a]

AQCR Name	AQCR No.	Fuel Burned		
		Type	Amount[b]	% S
Androscoggin Valley	107	Coal:		
		Anthracite	510	0.7
		Bituminous	370	0.6
		Oil:		
		Distillate	17,540	
		Residual	170	2.2
		Gas:		
		Natural	650	
		Process	0	
		Wood:	2,200	
Merrimack Valley - Southern New Hampshire	121	Coal:		
		Anthracite	5,780	0.7
		Bituminous	12,530	0.6
		Oil:		
		Distillate	283,520	
		Residual	13,240	1.9
		Gas:		
		Natural	20,330	
		Process	0	
		Wood:	18,500	
Central New Hampshire	149	Coal:		
		Anthracite	630	0.7
		Bituminous	1,340	0.6
		Oil:		
		Distillate	36,130	
		Residual	780	1.9
		Gas:		
		Natural	2,680	
		Process	0	
		Wood:	5,200	

a - NEDS data

b - Coal in tons; oil in 1,000 gals.; gas in MCF, wood in tons.